

**CLAIMS**

**I Claim:**

1           1. A device for combining a plurality of arithmetic flags, comprising:  
2           a combination function module that examines a plurality of arithmetic flags,  
3           determines field size of the plurality of arithmetic flags and based on the  
4           determination of the field size will combine the plurality of arithmetic flags into a  
5           single combined arithmetic flag variable, wherein the plurality of arithmetic flags  
6           represent the status of a plurality of data items after a mathematical operation is  
7           performed by the processor on the plurality of data items.

1           2. The device recited in claim 1, further comprising:  
2           a condition check module that determines the status of the combined  
3           arithmetic flag variable and causes the processor to execute an appropriate  
4           operation based on the status.

1           3. The device recited in claim 1, wherein the field size is based either a  
2           nibble, byte, half word, or word in length.

1           4. The device recited in claim 3, wherein the plurality of arithmetic flags  
2           further comprise:  
3           a negative data value, a zero data value, a carry out occurrence in a data  
4           value, or an overflow condition in a data item in the plurality of data items.

1           5. The device recited in claim 4, the combination function module performs  
2 either an AND or an OR operation.

1           6. The device recited in claim 2, wherein the status determined by the  
2 condition further comprises:

- 3           any data item has overflowed;  
4           any data item has not overflowed;  
5           any data item is positive or zero;  
6           any data item is negative;  
7           any data item is zero;  
8           any data item is not zero;  
9           any data item has a carry out;  
10          any data item does not have a carry out;  
11          all data items have overflowed;  
12          all data items have not overflowed;  
13          all data items are positive or zero;  
14          all data items are negative;  
15          all data items are zero;  
16          all data items are not zero;  
17          all data items have a carry out; and  
18          all data items do not have a carry out.

1           7. A method of combining a plurality of arithmetic flags for presentation to  
2 a processor, comprising:

3           determining a field size of the plurality of arithmetic flags on which to base a  
4 combination process, wherein the plurality of arithmetic flags represent the status of  
5 a plurality of data items after a mathematical operation is performed by the  
6 processor on the plurality of data items;

7           extracting the plurality of arithmetic flags based on the field size;

8           combining the plurality of arithmetic flags based on a function selected when  
9 a combination process is selected; and

10          storing a result of the combining of the plurality of arithmetic flags in a  
11 destination register for access by the processor.

1           8. The method recited in claim 7, wherein the field size is based either a  
2 nibble, byte, half word, or word in length.

1           9. The method recited in claim 8, wherein the plurality of arithmetic flags  
2 further comprise:

3           a negative data value, a zero data value, a carry out occurrence in a data  
4 value, or an overflow condition in a data item in the plurality of data items.

1           10. The method recited in claim 9, wherein the function further comprises:  
2 an AND or OR operation.

1           **11.**    The method recited in claim 10, wherein the function may be used to  
2 determine the status of the plurality of data items, said status comprising:

3           any data item has overflowed;  
4           any data item has not overflowed;  
5           any data item is positive or zero;  
6           any data item is negative;  
7           any data item is zero;  
8           any data item is not zero;  
9           any data item has a carry out;  
10          any data item does not have a carry out;  
11          all data items have overflowed;  
12          all data items have not overflowed;  
13          all data items are positive or zero;  
14          all data items are negative;  
15          all data items are zero;  
16          all data items are not zero;  
17          all data items have a carry out; and  
18          all data items do not have a carry out.

1           **12.**    An apparatus comprising a data storage medium for storing  
2 instructions when executed by a processor results in, comprising:

3 determining a field size of the plurality of arithmetic flags on which to base a  
4 combination process, wherein the plurality of arithmetic flags represent the status of  
5 a plurality of data items after a mathematical operation is performed by the  
6 processor on the plurality of data items;

7 extracting the plurality of arithmetic flags based on the field size;

8 combining the plurality of arithmetic flags based on a function selected when  
9 a combination process is selected; and

10 storing a result of the combining of the plurality of arithmetic flags in a  
11 destination register for access by the processor.

1 13. The apparatus recited in claim 12, wherein the field size is based either  
2 a nibble, byte, half word, or word in length.

1 14. The apparatus recited in claim 13, wherein the plurality of arithmetic  
2 flags further comprise:

3 a negative data value, a zero data value, a carry out occurrence in a data  
4 value, or an overflow condition in a data item in the plurality of data items.

1 15. The apparatus recited in claim 14, wherein the function further  
2 comprises an AND or OR operation.

1           **16.**   The apparatus recited in claim 15, wherein the function may be used  
2 to determine the status of the plurality of data items, said status comprising:

3           any data item has overflowed;  
4           any data item has not overflowed;  
5           any data item is positive or zero;  
6           any data item is negative;  
7           any data item is zero;  
8           any data item is not zero;  
9           any data item has a carry out;  
10          any data item does not have a carry out;  
11          all data items have overflowed;  
12          all data items have not overflowed;  
13          all data items are positive or zero;  
14          all data items are negative;  
15          all data items are zero;  
16          all data items are not zero;  
17          all data items have a carry out; and  
18          all data items do not have a carry out.

1           **17.**   A method of extracting a plurality of arithmetic flags for presentation to  
2 a processor, comprising:

3 determining a field size of the plurality of arithmetic flags on which to base a  
4 combination process, wherein the plurality of arithmetic flags represent the status of  
5 a plurality of data items after a mathematical operation is performed by the  
6 processor on the plurality of data items;

7 extracting the plurality of arithmetic flags based on the field size; and  
8 storing a result of the extracting of the plurality of arithmetic flags in a  
9 destination register for access by the processor.

1 **18.** The method recited in claim 17, wherein the field size is based either  
2 a nibble, byte, or half word in length.

1 **19.** The method recited in claim 18, wherein the plurality of arithmetic flags  
2 further comprise:

3 a negative data value, a zero data value, a carry out occurrence in a data  
4 value, or an overflow condition in a data item in the plurality of data items.

1 **20.** A method of extracting a plurality of arithmetic flags for presentation  
2 to a processor, comprising:

3 determining a field size of the plurality of arithmetic flags on which to base a  
4 combination process, wherein the plurality of arithmetic flags represent the status of  
5 a plurality of data items after a mathematical operation is performed by the  
6 processor on the plurality of data items;

7 extracting the plurality of arithmetic flags based on the field size; and  
8 storing a result of the extracting of the plurality of arithmetic flags in a  
9 destination register for access by the processor.

1 **21.** The method recited in claim 20, wherein the field size is based either  
2 a nibble, byte, or half word in length.

1 **22.** The method recited in claim 21, wherein the plurality of arithmetic flags  
2 further comprise:  
3 a negative data value, a zero data value, a carry out occurrence in a data  
4 value, or an overflow condition in a data item in the plurality of data items.